

THE MAINLINE RADIO TELETYPE CODEMETER

TUNING
INDICATOR

LOOP
RAVE
70V

SOVS
NORM
84V

TRANS
NORM
.25

POWER
ON
.75

POWER
P-IND
100

RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRY

JANUARY 1963
30 Cents
Vol. 11, No. 1



**HORSE
TRADES**

This page of the Bulletin is for use of amateurs who have RTTY EQUIPMENT FOR SALE OR TRADE and those looking for equipment to buy or trade. It is a free service and may be the means of getting someone on the air.

Return Postage Guaranteed



TENTH ANNIVERSARY RTTY SWEEPSTAKES FEBRUARY 15, 16 & 17

The 1963 Anniversary Contest will be held starting Friday, February 16 at 2300 GMT and run for thirty hours, ending at 0500 GMT on the 18th.

Messages shall consist of message number, originating station call, check or RST report of two or three numbers, ARRL section of the originator, GMT (0000-2400), date, and band used (Meters or Megacycles).

Scoring will be one point for a msg sent and receipted for entirely by RTTY, and one point for a message received and acknowledged by RTTY. Relaying or repeating by a third station disqualifies the message. The total message points is multiplied by the number of ARRL Sections worked to compute final score. Two stations may exchange messages again on a different band for added message points, but the section multiplier does not increase when the same section is worked on another band. ARRL Sections are as listed in QST (usually page 6) covering Canada, U.S.A. and some possessions. Each foreign country not included as a section but regarded by ARRL for DXCC credit is treated as a new section for RTTY multiplier credit.

Entries to the contest must be mailed within 15 days of its close, and must contain a tabulation of complete message data required by paragraph above both for messages sent and received. It should clearly indicate each

new section worked, total section multiplier, total message points, computed score claimed, and a signed statement that all rules have been complied with. At the suggestion of any amateur (or on its own initiative) the judges in the contest may request the original printer copy from any contestant, it being interpreted as record message communications within the meaning of FCC Reg. 12.136 (h) to be retained one year.

Certificates of award will be issued to the highest scoring station in any state in which there are 3 or more contestants. However an exception may be made where home state or country competition is not available provided the applicant specifically requests the award and makes a satisfactory showing of operation of least one quarter of the contest time and his score is above the lowest one-fourth of the contestants. The decisions of the judges are final.

Contest hours may be changed from time to time. Currently they are: Start: Friday 2300 GMT (6 PM EST, 5 PM CST, 4 PM MST, 3 PM PST). End: Sunday 0500 GMT (12 PM EST, 11 PM CST, 10 PM MST, 9 PM PST).

As the contest nears the date February 20 commemorates the anniversary of FSK authorization, only F-1 emission will be used in this contest on bands between 3.5 and 30 megs.

mark and space seems to have almost negligible effect on the receiving end. With the S Line used in the transceiver style automatic monitoring is accomplished. The receiver function switch is operated in the 'OPR' position. The Vox gain should be advanced to nearly full CW (clock wise) position.

I use the W4MGT audio transistor oscillator in its original version (RTTY June '62). Although this circuit had its collector and emitter switched the uncorrected version will produce very stable oscillations if the base 10K resistor is changed to 1 k and C1 is changed to .05 MF. If the diode keyer is used to switch in a .1 MF capacitor the shift can be adjusted from approximately 450 cycles (Narrow shift) to 850 cycles by simply adjusting the slug in L1.

RTTY WITH "S LINE" EQUIPMENT

By Don Middleton, W0NIT
920 West Adams
Pueblo, Colorado

S Line RTTYers will probably be interested to know that it is not necessary to modify either the receiver or the transmitter for presentable RTTY.

I returned my TU (W2PAT) for 2000 and 1150 cycles and get good copy with the 75S1.

The 32S1 transmitter was not intended for continuous service but works very nicely if it is loaded under 200 ma and additional fan ventilation is provided for the final tubes. Without this ventilation the 6146s will eventually arc over and blow a fuse. Gene Senti of the Amateur Division of Collins Radio Co. states that the transmitter should be ventilated and operated in the ALC position for RTTY. The change in plate current with

GETTING STARTED ON RADIOTELETYPE

V—RADIOTELETYPE CONVERTERS

And Introducing THE MAINLINE CONVERTER

By Irvin M. Hoff, K8DKC
1733 West Huron River Drive
Ann Arbor, Michigan

A radioteletype converter (also often called terminal unit or "TU" from commercial terminology) is a device that changes incoming radio signals to DC pulses to operate teleprinter equipment.

These converters (and we shall use the term "TU" interchangeably during the article) are basically of two general types: those that are in the IF section of the receiver and change RF frequency shift into DC pulses. The other type hooks onto the audio output of the receiver—usually the 500-ohm tap if there is one. These converters normally use the tones of 2125 and 2975 for standard 850 cps shift.

Usually the RF type converter is somewhat more complicated and difficult to adjust and build than the audio type. Many of the surplus items that became available after WW-II were of this type. They of course presented minor problems with regard to hooking them to the receiver, and usually required a 455 kc IF, which many receivers no longer offer.

Before going into the audio type, we might mention the "dual diversity" type of converter. Since selective fading can result in unreliable printing, the military made use of multi-antenna installations. Often these antennas were separated by great physical distances—the theory being that a fade on one antenna might place a surge on the other. The antennas were then hooked to separate receiver-converter systems, and their outputs then combined so that the final signal would be at a more constant level. This would produce much better copy.

For the average amateur, use of separate antennas is not very often possible. Sometimes, however, improvement can be gotten by using a horizontal dipole in conjunction with a vertical antenna. However only a very few ham RTTY enthusiasts have ever done much of this type of reception, and thus those military converters offering diversity reception are usually modified to receive only on the one channel.

The audio type of converter is perhaps used by 90% or more of the amateurs, so we will concentrate on this type. They offer the advantage of being adaptable to any receiver. However, it must be stated that a few receivers will not pick up the 2975 tone, and on these receivers (such as the Collins "S-line" that use a 2.1 kc mechanical filter that cuts off around 2400 cps) other tones are

often used; such as 1275 and 2125, etc., or the receiver can be modified to receive 2975.

Since FSK transmission is actually a form of frequency modulation or FM, many of the terms used in regards to converters have their origin from FM definitions.

In your FM hi-fi receiver, a "linear discriminator" is used. Some RTTY converters have been built using this type of discriminator, although none in recent years has concentrated on this circuit that have been called to our attention. If you were interested primarily in narrow shift (perhaps 170 cps and less) then this type of discriminator offers great potential.

However, the linear discriminator has certain disadvantages for the wider shifts as they do not have the ability to reject what you do not wish to use, by virtue of being "linear". In the case of RTTY, you are only interested in two tones, plus the modulation on each of the tones which is due to the keying rate.

Thus we come to the most common type by far of all the converters—the "two-filter" converter. Many diagrams call the section in which the filters appear the "discriminator" but this is really incorrect, since with only two tones, we really are not utilizing the FM discriminator type of circuit at all.

It should be realized, though, that in the sections where the filters appear the separation of the two audio tones occurs. In a broad sense we can say this is discriminating against all other tones. There surely should be some better term than the more general one, though, so we will refer to this as the filter section.

Composition of the Typical Converter

Depending upon signal strength; fading; volume control setting; etc. the output fed to the converter can vary wildly. Also many older receivers cannot use the AVC while receiving CW, RTTY, etc. (By all means if your receiver is of the newer type that can use AVC on RTTY, be certain to run your RF gain control full open to utilize the AVC to the greatest to guard against fading, etc.).

We will show later various reasons why the tail-end sections of the converter need a constant voltage for correction operation. To get this, we use a large amount of limiting at the front of the converter. Typical amounts of limiting are around 30 db.

We should like to mention now that the majority of selectivity should have already been introduced before we get to the limiters. A receiver using a 1200 cycle bandpass is highly desired. A "comb-type" bandpass input filter, also before the TU is highly recommended. Many articles in the past have discussed these filters, and later on you may want to obtain or build such a filter. Electrocom Industries of South Bend sell an excellent bandpass input filter for use with those receivers that have only modest selectivity available. These filters are multi-section, toroids, and are fairly expensive, selling for around \$35, but this illustrates in some extent the problems in making your own.

We do not like to refer to other articles, since it is assumed the reader often does not have access to these other articles, but there is an excellent and lengthy paper in the November 1962 issue of "73" magazine on filters, etc.

Following the limiter stages, we have the filter section where the two tones are separated. Next is the detector stage, where (like in any receiver) the carrier is demodulated from the information. In other words, rectified. Here is where the various types of converters spread out their ideas differently. Some of the converters use two tubes at this point in such a fashion that a mark signal will cut-off of the grid of the opposite tube while conducting the grid of the first. When the space signal occurs, (mark now absent of course) the reverse happens. Thus if you placed a polar winding in each plate circuit, it would operate the relay alternately as mark and space were received. This essentially is the basic method of the W2PAT and W2JAV TUs.

Another system uses a single tube, and different voltages to drive the tube into full saturation for mark and cut-off for space. A final method uses a "flip-flop" section similar to those used in counters, computers, etc. The "flip flop" consists of a dual-triode wired in such a fashion that it must go completely from one condition (conduction) to the other (non-conduction) with no in-betweens.

The flip-flop probably puts out the best-looking square wave of any of the methods mentioned. It stays on the last condition until it receives a "change-over" pulse.

In this last type circuit, the "flip-flop" then drives a keyer tube, which in turn is hooked to the printer.

The End Result

Since the teleprinter works on DC pulses, these must be square-wave pulses to allow the printer to have maximum range. Since the pulse length is around 22 milliseconds, and since the printer only uses about 4 milliseconds of this, it would not be necessary to reconstruct a perfect square-wave pulse to get decent results. However, if you had a range of 20-105 on your printer, you could tolerate

more bias and distortion of the incoming signal than could the fellow whose converter limited him to 60 to 70 points range or less.

Thus the whole idea is to convert these radio signals into perfect square waves, if possible.

Various Converters in Use

The W2PAT converter is no doubt the most famous of all, and has appeared in every issue of the QST Handbook for many years. It has been superseded by other more efficient units, and like a Ford Model A, has very little to offer, other than they do work.

The W2JAV is a very popular unit, and probably more of these are in use today than any other single unit. It is a modernized W2PAT circuit, but retains such out-dated features as printer coils in the cathode circuit (optional polar relay, which many people also feel to be outdated.)

The W2JAV does have good limiting, more selective filters, and a feature of being able to copy on mark only or space only.

One of the older and better circuits that has been much copied is by W6ZH (currently the President of ARRL) and W6AEE (our editor of this bulletin). This circuit has undergone certain revisions and at present is being revised once more by W6AEE.

One of the most deluxe of the "built-it-at-home" TUs is that by W6NRM. If you have access to the January and February issues of 1961, you will find one of the most comprehensive and interesting articles regarding converters that we have seen published. The W6NRM unit offered several versatile features all in one unit—and makes a very wonderful converter. He is at present also hard at work on a new Mark V version which will be transistorized.

W2JAV also has done a great deal of work with transistors and several versions of his recent converter have appeared in other publications.

Commercial Converters

Radioteletype is not new to commercial broadcasters. However, there are only two converters manufactured (to our knowledge) that most hams could consider financially. The Altronics-Howard unit was designed by W4EHU who in the past has written several excellent theoretical articles for this bulletin.

This unit sells for about \$200. It has no particularly novel features, and uses an out-moded "magic eye" indicator that seems to us to be little better than nothing at all. However, it does use a form of discriminator circuit that allows it to copy from 100-1000 cps shift.

These units are used by the "HOPE" project—one on the ship and one in Washington. Several hundred contacts have been made by K8DKC to these stations with excellent results at both ends.

We have sent narrow shift, and they do copy 170 cps but the poor tuning indicator

makes reception of narrow shift rather unsatisfactory.

The largest company specializing in RTTY principally for amateurs is "Electrocom Industries" in South Bend. They build the excellent FSC-250 RTTY converter as well as a complete line of filters, tone keyers, etc. These tone keyers are for use with single-sideband transmitters or for AFSK on other types.

The FSC-250 is around \$325 depending upon filters selected, etc. It offers such deluxe features as oscilloscope; mark-lock; auto-start; mark-only or space-only (which in turn in conjunction with the flip-flop circuit it has permits excellent copy of narrow shift with "single-filter" reception); and duplex operation.

The traffic mentioned previously has been received at K8DKC using a FSC-250.

THE MAINLINE CONVERTER

In connection with this series of articles, we felt that a number of components could be recommended that would allow the station to be built around these items.

Great variation can be accepted on transmitters and receivers, but three items go hand-in-hand to make station operation the most simple:

- (1) The FSK system
- (2) The Receiving Converter
- (3) The Station Control

Since these items work so closely together, we thought it would be best to include diagrams of a satisfactory combination of units that would integrate easily into a versatile complete station.

Thus the name "MAINLINE" was born. In the November issue of RTTY, you saw the first of the three units, although the name "MAINLINE FSK SYSTEM" was inadvertently left off.

In this article you will see the second of the two units, the "MAINLINE CONVERTER" (The complete title being the heading above).

Various converters were appraised for their adaptability to some of the ideas currently being used by some of the more advanced manufacturers. We decided that a brand-new and modern design should be made for the home constructor.

As a result, W8SDZ (Keith Petersen of Toledo, Ohio) offered to help in the design and construction of the new converter. The project has been a joint effort and many other individuals have been consulted both in the planning stage and in the testing. Of these, K9BRL in particular was most helpful in offering advice and technical assistance. The final unit as pictured was built by W8SDZ.

Features

1. Novel new indicator tube never before used on any Converter or TU.
2. 50db. of limiting—far more than in most converters.

3. Simple and inexpensive yet most effective input level indicators.
4. Simple and readily obtained two-filter system using TV-width coils, which offer no technical problems in tuning, building, etc.
5. Extended use of silicon diodes to keep heat to a minimum and to aid in construction.
6. Only three tubes; plus voltage regulator and indicator.
7. Muting switch to kill the printer while tuning, etc.
8. Computer-type flip-flop to give absolute swing to the keyer tube.
9. Improved type of limiter giving excellent square wave output to the filter section.
10. Built-in FSK driver with reverse switch to operate the Mainline FSK Keyer shown in November issue.
11. Selector magnets of printer and key-board always in series even for transmit.
12. Local copy during transmit independent of receiver frequency.
13. No polar relays needed or desired.
14. One side of keyboard may be grounded.
15. Selector magnets at nearly ground potential during mark.
16. Absolutely a square wave delivered to the keyer tube and to the printer magnets.
17. Ability to copy "upside-down" shifts normally.
18. Zero bias.
19. Minimum distortion.
20. Has range identical to that of the best local loop.
21. Total cost using all brand new parts of premium quality less than \$75. This can be pared down substantially using lesser-known brands or surplus items.
22. Provisions for input "comb" filter if desired.

The Revolutionary Indicator

The new indicator tube is a *Telefunken* EMM-801 and is not manufactured in this country under any American tube type. It is a "dual-bar fluorescent indicator tube", and has the mark and space presentation side-by-side. It costs around \$3 and can be obtained through any dealer using Telefunken tubes, although few dealers stock the tube. The following company has offered to maintain a small stock:

Universal Service
114 North Third Street
Columbus 15, Ohio

The tube fits a standard miniature 9-pin socket and thus mounts in a few minutes into a very small space. It is similar in size and appearance to a 12AT7 and can be mounted in the same manner.

The Limiters

Various types of limiters were tried. Zener diodes were used, but they are not available

in the voltage range needed ($\frac{1}{2}$ -volt). Germanium diodes were tried, but they do not have sufficient voltage ratings for the 100-150 volt swing on the input transformer. Also regular silicon power diodes (which have 400 volt peak ratings and more) proved to give by far the best square wave output.

The two-sections of the 12AT7 build up the voltage and further limit through use of saturated grid swing. The final output is constant within $\frac{1}{2}$ -db with variation of input of 50 db.

The Filters

Toroids are not readily obtainable at the commercial supply houses. Also they are normally a fixed value and properly tuning them is somewhat difficult. Their "Q" is also so high that they must be detuned on purpose by using "swamping" resistors. In this converter, we are using readily obtained TV-width coils. Their "Q" is very low, but they do a very good job. If the filters are quite narrow, then you have no tolerance with respect to poorly set shift; or a badly drifting receiver or transmitter. If the filters are too broad, they allow signals to affect the keyer tube that you don't want to receive. However, these tones usually must be eliminated in the receiver rather than in the converter, or they will normally cause trouble no matter what you do after the limiters.

The TV-width coils give quite good results, and should cause no concern over their low "Q". Since the flip-flop stage later only samples a portion out of the center of the filters anyway, they are an excellent choice.

The Detectors

Here we selected the 1N100 diodes as they have a very high reverse resistance. Other diodes were better in this respect, but are not stocked by the average supply house.

In the Detector section you will note four 1N100's. Two of these are the detectors proper, which rectify the audio tones comes through the filters; and the other two are used for the indicator circuit. A small amount of filtering after the detectors is offered.

The Flip-Flop

This is a computer-type circuit whereby the output stays either conducting or non-conducting and no "in-between". Thus if a small static burst comes in that is too weak or too short in duration to trigger the flip-flop, nothing happens. The output from such a circuit HAS to be a square wave. If the signal disappears, the tube remains as it was last and remains either on mark or on space. Thus unlike some converters, this unit does not attempt to think for itself, but follows the incoming signal. The four NE2 lamps are not trigger lamps, but are DC coupling devices giving a constant voltage drop between the plates of the flip-flop and the grid of the keyer tube.

The Keyer

This stage is a 6W6GT. The grid is driven

either positive (conducting) or negative (non-conducting) by the output of the flip-flop tube. It therefore acts as a switch in the printer circuit, allowing the printer to go from mark to space.

In the grid circuit will be seen the switch S₁—this switch when closed puts the tube in a conducting state which keeps the printer on idle (mark). This is useful and in effect gives a "standby" action. It is used also when going to transmit, so that the loop supply in the plate of the 6W6GT can deliver its own local coov and also key the FSK unit. To this extent, you will note that pin 5 of the outplug also has this terminal, and one can easily ground pin 5 externally with the transmit switch, etc. to go into a standby condition.

You will note that this converter incorporates the complete local loop and FSK driver system of the November issue—all that is needed is the Mainline FSK Keyer in the transmitter. That is the part (Figure 6; Page 7 of November RTTY) to the right of the switch.

The Power Supply

This unit even when running a 60 ma. loop uses so little current that a $\frac{1}{2}$ -amp slo-blo fuse may be used. All diodes in the power supply should be rated at least 280 volts RMS. (Most silicones are rated only at 130 VRMS—be very careful when you buy or else use two in series instead of only one.)

Typical voltages are:

High Voltage	215 VDC
Regulated	150 VDC
Negative Bias	-170VDC

Future Possibilities

There are several items that could easily be added, and a further article might be desired later in the series. One could easily add mark-only or space-only reception to this unit. As a rule, though, when a signal is being ruined to where copy is not possible, it usually is due to overloading the receiver AVC. Under these circumstances, you can do little or nothing to improve things back at the converter.

Mark-only reception however, with this unit, (due to the action of the flip-flop) will allow signals to be copied when the shift is too far off for normal reception.

Narrow shift can be copied with this converter, by either returning one of the filters to some extent; switching in additional capacity on the space filter; or a combination of both.

If you are using the Collins "S"-line receivers where the 2975 tone may not be received, you will not in the parts list that you can substitute values for the normal ones.

Hooking up a scope to points I₁ and I₂ would be a simple matter if desired for additional presentation.

An automatic hold system will be devised so that in event of no signal input, the flip-flop would automatically go to the mark condition. For those of you who are eager, you

could do it yourself using a relay to short out the switch in the grid circuit of the keyer tube. You could hook a plate sensitive relay in the plate of the first stage 12AT7, so that with normal signal the relay would be closed and open set of contacts would be used. Then with a loss of signal, the relay would open and those contacts would now close (the lower set of a SPDT contact). A pot across the relay winding would adjust so that noise would not hold it in.

Narrow shift CW ID could be added.

Various other features will come to mind as your experience grows and your station adds equipment. This, however, is a good basic design and will perform right along with the most expensive commercial units.

Reminder

To get the utmost from this converter, it will be necessary to run the receiver at a much higher level than you are perhaps accustomed to. This is due to the very high amount of limiting being offered. Be sure the RF gain is wide open if a SSB type to receiver having a product detector. Then advance the audio enough that the NE2 indicator lamps will fire. These are across T₁ and should be placed on the front panel so they can be constantly observed. From the picture on the front cover you will note they have been placed on either side of the indicator tube, and mounted in $\frac{1}{2}$ " grommets.

Keeping these indicators lit will provide excellent safeguard against rapid fade, and will enable this unit to "get out and dig" into the QRM, etc.

The receiver will be running about two-thirds of the way open, and the loudspeaker would be ruined at this level. Put a 15 ohm wire-wound rheostat or "L-pad" in the speaker so that a satisfactory level may be maintained. DO NOT ADJUST YOUR TU TO A COMFORTABLE SPEAKER LEVEL IF YOU WANT GOOD RECEPTION OF RTTY!!! Adjust, instead to what is proper, and then adjust the speaker, or disconnect it. The output of the receiver should be about 5 VAC on the 500 ohm line.

The Pictures

On the front panel, the indicator tube is in the middle; and the input level indicators are on either side.

The first switch is the muting switch (also called standby; blind; kill, etc.). The second switch is the normal-reverse in the event the transmitting station is accidentally "upside-down".

Switch three is for the FSK driver, and allows those transmitters needing to be "turned over" on certain bands to transmit a proper signal.

The last switch is the power switch.

These have been arranged in such a manner that for normal operation they are all in the up position.

Testing

This unit was thoroughly tested at several different stations, and with many pieces of test equipment not available to but very few designers. These include square wave reversal generators; slow-scan oscilloscopes; frequency counters; saw-tooth oscillators, etc.

Again we wish to thank W8SDZ for the many hours of time he put in during his vacation in order to get this finished in time for publication.

Parts List

- T₁ Stancor A-4778 Audio Input or Triad A-3X
- T₂ Stancor A-4292 Driver (Do not substitute)
- T₃ Stancor PA-8421 or Merit P-3045 (or others)
- T₄ Stancor PC-8419 or PM-8419 or Merit P-3147
- S₁ SPDT Reverse switch (for "upside-down" stations)
- S₂ SPST Mute switch (allows local copy from keyboard)
- S₃ DPDT FSK normal-reverse switch
- S₄ DPST Main Power Switch
- L₁ Miller 6319 TV-width coil (mark) set for about 37 mh.)
- L₂ Miller 6319 TV-width coil (space) set for about 28 mh.)
- L₃ Stancor C-1279 8.5 hys. @ 400 ohms or Merit C-2981

NOTE: If the tone of 1275 instead of 2975 is to be used, use:

- L₂ Miller 6324 set for about 70 mh. and a 0.25 condenser
- D_{1,2} Sarks-Tarzian M-500 Silicon Rectifiers
- D_{3,4,5,6} 1N100 Germanium diodes
- D_{7,8,9,10} Sarks-Tarzian F16 (1N2484) rated 420 VRMS
- C₁ 0.05 400 volts
- C_{2,3} 10 MFD. 25 WVDC
- C₄ 0.15 MFD. 400 VDC
- C₅ 0.1 MFD 400 VDC (See note above for 1275)
- C_{6,7,8,9} 0.001 MFD 1000 VDC disc ceramic
- C₁₀ 100 MMFD. 1000 VDC

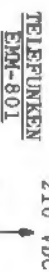
Connectors

Plug 1 goes into Plug 2 socket unless an input filter is used. Plug 3 is on the rear deck of the chassis and Plug 4 has the external connections to the associated equipment.

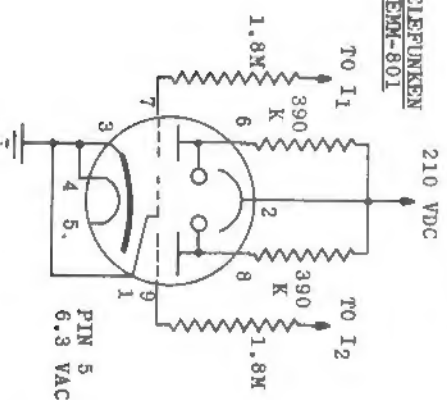
PLUG 4 would have these connections:

- 1 & 8 To printer and magnet in series with keyboard
- 2 & 3 To 500-ohm audio output of receiver or to external V.C. to 500 ohm transformer.
- 4 Not used at present
- 5 To external muting switch on station control
- 6 & 7 To Mainline FSK Keyer in transmitter. (Do not hook to ordinary keyer, as the voltage on these two terminals reverses from mark to space).

<u>INPUT</u>	<u>LIMITERS</u>	<u>FILTERS</u>	<u>DETECTORS</u>
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K8DKC





W9BTA

**2828 South Ninth Street
Sheboygan, Wisconsin**

Am enclosing a picture of shack, including the O. M. This picture was taken by the Sheboygan Press and used with a feature story on me and my ham shack.

RTTY gear in the shack includes the following: Model 15 Page Printer; Model 14 Typing reperforator; Model 14 TD distributor; Tuning Unit copied after W2PAT with two filters ahead of limiter; Viking V. F. O. as FSK; Viking II Transmitter; HQ 160 Receiver; Eico 5 inch Scope; Cycle Meter 0 to 1000-0 to 10,000 Cycles.

(Continued from Page 14)

has been no successful activity on 7040 can be refuted by my own experience. This writer has had successful two-way RTTY contacts with stations in eleven foreign countries on five continents—all on 7040—and with a very mediocre antenna system and moderate power.

As the sun spot cycle continues to cause erratic conditions on the higher frequency bands it seems inevitable that many will move their operations to forty and eighty meters. If you haven't tried 7040, give it a whirl — You might be pleasantly surprised. 7040 has the identical propagation conditions to offer as does 7140—but without the BC heterodynes and the jammers. If we all pull together in this hobby of ours we won't pull apart at the seams when the going gets rough.

73, Bud, W6CG

I work 75-40 and 20 meter bands, mostly the 75 meter band due to working hours. Enjoy RTTY very much, as there seems to be no end to rebuilding and experimenting with different circuits.

Best of luck, 73

William E. Barrett-W9-BTA

WANTED: Cover and tape reel for 14 typing reperforator. WOFLK, Rt. 1, Box 35, Grand Rapids, Minnesota.

FOR SALE: Model 28 typing reperforator, sync motor, working order, with 3 speed base (60, 75 and 100 wpm) type LPR \$135.00 Model 14 typing reperforator, 60 wpm sync motor, end of line, rapid feedout, kybd base, cover with glass and tape reel, working order \$90.00, K5BQA, 10756 Wyatt Circle, Dallas, Texas.

WANTED: Look at your address on cover, if there is an error, or your call is not given, write to RTTY, INC., 372 Warren Way, Arcadia, Calif.

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For "RTTY" Information:
W6DEO W6CG W6TPJ W6AEE

BRITISH AMATEUR RADIO TELEPRINTER GROUP

By G2UK

B. A. R. T. G. A. G. M.

The 2nd Annual General Meeting and Get-together was held at "The Olive Branch", Marylebone, London, on 3rd November 62; the last day of the Radio Communications Exhibition. Some twenty eight folk were present, including three overseas visitors, PAØFB, PAØLQ and LA5LG, President of the Norwegian Amateur Radio Society and a keen RTTY operator.

After the business meetings and refreshments a transparency slide show was put on, PAØLQ, who is second operator of PAØAA, showing some fine colour slides of that station. Slides were also shown of G3NES's fb station, G2FUD's station and a number from the Hon. Sec.'s collection. David Wadsworth showed his very unique two speed governor for the Type 7 machine, which produced much interest.

The Hon. Sec. reports a good financial position for the Group and that the Group now numbered over 100 members. A welcome was given by the Chairman, Len Newnham, G6NZ, to the overseas visitors, who said their presence was a good indication of the increasing interest in RTTY which was growing in Europe.

The Hon. Sec. reported that the "Manual" which the Group had produced had proved a great success, both in its usefulness to the newcomer to RTTY and in its financial profits to the Group. The first edition was nearly sold out, and the preparation of a second edition was authorised.

7040 KCS. vs. 7140 KCS.

(AN EDITORIAL)

In the past few weeks this writer has noted a certain amount of agitation by some individuals and a National Ham Magazine to change the forty meter operating frequency from 7040 to the 7140 spot that was formerly used by the RTTY group. The reason given by the advocates of this change is that the CW QRM situation on 7040 is intolerable.

Before commenting on the merits of returning to the 7140 spot, let's take a brief look at the history of this situation. When FSK operation was first authorized by the FCC back in December, 1952 the pioneers of this new mode arbitrarily chose 7140 as a common meeting place when operating on the forty meter band. This spot became very popular among the RTTY clan until the late '50's when a number of strong foreign BC stations began operations on and around 7140, bringing with them the usual jammers from their political enemies. The QRM situation became so untenable to the RTTYers that by popular demand a poll was taken by

Thanks were expressed to Harry, PAØLQ, for the service to European RTTY which the RTTY News Bulletin from PAØAA had given. This had greatly stimulated interest in RTTY, particularly amongst the 'receiving only' members, of whom there were quite a number.

A good rag-chewing session concluded a very pleasant evening.

From that, you'll see we had a very fb evening. Activity over here is increasing steadily, particularly on two metres and 80. Conditions on the DX bands now so poor, activity is limited there. I believe Bill, 3CQE is writing you about the SS RTTY Contest, so will leave him to deal with that.

Many thanks for your last letter, which I read with much interest.

Enjoying my Teletype 14 machine. Yes, it is the strip type, but suits me fine.

Winter weather has set in early here, some snow this past week. So guess that'll bring the boys back into their shacks—hi! Amateur radio activity drops very heavily over here during the summer months, particularly in regards to RTTY—where mobile operation is not yet very practical—hi!

All the best for now and a good Christmas and New Year. Little early to say this I know but may not be writing again before then, so all the best, and lots of luck with the "RTTY Magazine" during 1963. We all enjoy it. 73.

Doc, 2UK

a number of clubs and teleprinter societies across the nation to determine where the majority desired to "stake out a new claim." 7040 was the first choice of those participating in the poll. This choice was further influenced by the fact that many of the foreign amateurs regulations do not allow RTTY above 7050 kcs.

The question now arises to why the sudden agitation by a small group to return to 7140? The QRM situation there has not abated but on the contrary has increased a great deal in the past year as these foreign broadcasters increase their power in an attempt to override the static from the jamming stations. The argument that the CK QRM on 7040 makes it impractical for RTTY is not valid. An actual survey taken on two week-ends showed that CW activity on 7040 was 30% less than on 7140 kcs. where RTTY operation has been very popular for a long time. The further claim by the 7140 advocates that there

(Continued)

DX-RTTY

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Happy New Year, DX'ers:

Hope 1963 brings all of you health, wealth—and a flock of new Countries on RTTY! Enough of the amenities . . . let's put the Wassail Bowl and the Tom and Jerry cups away for another year and get down to some serious DX'ing. Wayne, W8SEY, reports that he was the first contact for two new ones on 14 Mcs; DL4GS and KR6BE. The latter should be especially good news for those needing Asia to complete WAC. Speaking of WAC; Congrats to Lyle, WØFQW, on achieving WAC-RTTY #29!! Among the cards submitted by WØFQW was one from Beep, XEØBP, confirming a QSO made on his last night of operation from Mexico City. A truly worth-while keepsake from one of the real pioneers of RTTY.

One of the high points in the mailbag this month was a long letter from Cas, ex-KR6AK, under the dateline — Uijongbu, Korea. Cas points out that licensing has opened up in Korea and he hopes to be active from there in the near future. He reports that RTTY is not authorized but he is requesting special permission. Cas was up against this same obstacle when he fired up from Okinawa four years ago and managed to present a good case for FSK so I am sure he will be able to repeat from Korea. In the meantime watch for him around the RTTY channels on CW. (14 mcs — that is!).

Some good and some bad news from VK-land. Eric, VK3KF, will be inactive for at least six months due to the press of some urgent projects he is working on. Eric points out that he will continue to keep in touch through this column and is leaving the Aussie representation in the good hands of Bill, VK2EG, and Chuck, VK4RQ, both of whom are currently active. VK3KF is another of the real stalwarts of the RTTY DX movement and he will be sorely missed during his absence. Bruce, ZL1WB, tells me that the NZ authorities have upped the power limit to 150 Watts which should give the Zedders a better shake in these times of bad band conditions. A certain well known DX'er suggests that now all Bruce has to do to fulfil the requirement is to modify the "power" entry in his log. Bruce will neither confirm or deny this but from personal knowledge I know him to be an upright, law abiding citizen. Bruce; the above testimonial given free, with no strings attached! Hi Hi KH6COY/KW6 on Wake Island continues to pound into the West Coast but complains that he had trouble getting answers to his calls. Look for him on 14-

090 starting about 2300 until about 0300 or later when the band is open.

In case there is any doubt about European activity on RTTY Bill, G3CQE, sends in the following list of stations heard at his listening post: DL4IA, DL6EQ, DL1WX, DJ4KW, DJØEK, PAØFB, LA6J, LA5LG, GM3IQL, 11RIF, GM8FM, G3BXI, G3KZI, G2FUD, G3FHL, G2HIO, G6CW. Nearly all of the above appeared on Stateside logs during the recent contest so there is no question about their ability to put in a signal on this side of the Atlantic. G3CQE reports that the RTTY dinner in London was a real success. Before the meeting Bill and G3GNR had a chance to escort PAØLQ on a tour of the local radio junk shops. CQ and GNR also enjoyed meeting LA5LG and GM3ENJ during the festivities. Bruno, 11RIF, is still making excellent copy out here on the Coast even when band condx are exceptionally poor. ZS6UR and ZS1FD continue to keep the African Continent represented on both 15 and 20.

A number of the gang reported logging HH2P with a fine signal around 14,090 kcs. This one should appeal to those of you who are hunting for new countries on RTTY. Reports from the SF Bay area tell of a project up there to get a Swedish station on FSK. I understand a printer is being shipped along with the necessary terminal gear and hope to have more details on this one for the next issue. Merrill informs me that two stations in Ireland (EI) are hoping to make their debut on the teleprinter circuit very shortly. This is indeed good news. Hans, LA6J, writes that there are now more than 50 printers among the Amateurs in Norway. He says it may be some time before all show up on the air. Hans is watching the bands daily for openings to the States. He can use 10, 15, 20, and 80 but reports that 20 and 80 are the only bands open at present.

Don't forget to tool up now for the Tenth RTTY Anniversary Sweepstakes being held February 15-17. This is always a well attended event and this year will be no exception. It will be smart to remember that the rules for this one differ somewhat from the October bash. In the Anniversary Sweepstakes everyone operates under the same scoring arrangement. Also remember that each Foreign Country worked can be added to the Stateside multiplier so don't overlook them!

Next month will bring the complete summary of the results in the World-Wide DX Jamboree of last October so don't miss it!

Cheers and 73
Bud, W6CG